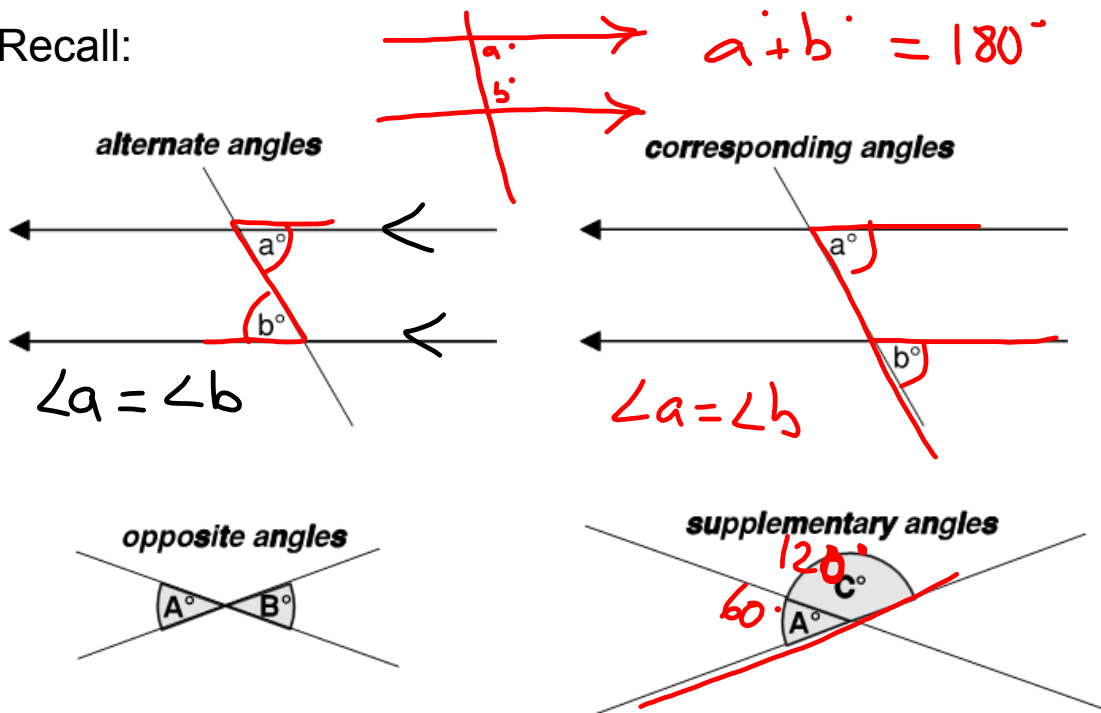
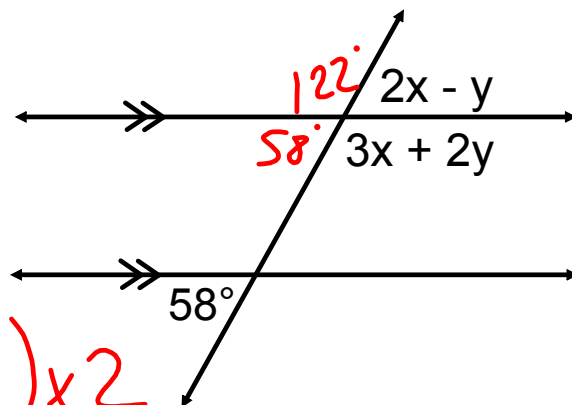


L9 - Applications of Linear Systems: Geometry, Money and Number Problems

Recall:



Ex.1. Determine the value of x and y .



$$\begin{aligned} \textcircled{1} (2x - y = 58^\circ) \times 2 \\ \textcircled{2} 3x + 2y = 122^\circ \end{aligned}$$


$$\begin{aligned} &4x - 2y = 116 \\ + &3x + 2y = 122^\circ \\ \hline \end{aligned}$$

ANS

$$\begin{aligned} x &= 34 \\ y &= 10 \end{aligned}$$

Ex. 2) The coin box of a vending machine contains half as many quarters as dimes. If the total value of the coins is \$22.50, how many dimes are there?

0.25 quarters
0.10 dimes

$$\begin{aligned} \textcircled{1} \quad d &= 2q \\ \textcircled{2} \quad 0.10d + 0.25q &= 22.50 \\ 0.10(2q) + 0.25q &= 22.50 \\ 0.20q + 0.25q &= 22.50 \\ \frac{0.45q}{0.45} &= \frac{22.50}{0.45} \\ q &= 50 \\ d &= 2q \\ d &= 2(50) \\ d &= 100 \end{aligned}$$


Ex. 3) A rectangle with a perimeter of 180 cm is four times longer than it is wide. What are the dimensions of the rectangle?

$$\begin{aligned} \textcircled{1} \quad 2l + 2w &= 180 \\ \textcircled{2} \quad l &= 4w \end{aligned}$$

$$\begin{aligned} w &= 18 \\ l &= 72 \end{aligned}$$

Ans

Ex. 4) The sum of two numbers is 72. Their difference is 48. Find the numbers.

$$\begin{array}{rcl}
 \textcircled{1} & x + y & = 72 \\
 + & \textcircled{2} & x - y = 48 \\
 \hline
 & 2x & = 120 \\
 & \frac{2x}{2} & = \frac{120}{2} \\
 & x & = 60
 \end{array}$$

Assigned Work:

- 1) Erik has \$4.80 in nickels and quarters. If he has 6 more nickels than quarters, how many of each does he have?
- 2) Hakim invested \$15 000. He put part of it in a term deposit that paid 4% per year and the remainder in a Canadian bond that paid 5% per year. After one year, the total interest was \$690. How much did Hakim invest at each rate?
- 3) The Student Council held a car wash to raise money. They washed cars for \$5 each and vans for \$7 each. They washed 45 vehicles and earned \$243. How many of each type of vehicle did they wash?

equations: 1) $0.05x + 0.25y = 4.80$
 $x - y = 6$
 2) $0.04x + 0.05y = 690$
 $x + y = 15000$
 3) $5x + 7y = 243$
 $x + y = 45$

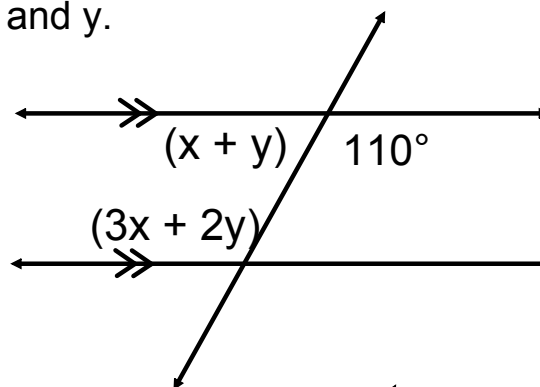
- 4) Two persons share a lottery worth \$1200. One person received \$800 less than 3 times what the other person received. How much did each person receive?
- 5) Wilfrid has a total of 23 dimes and quarters. The total value amounts to \$2.90. How many coins of each kind does he have?
- 6) In the good old days, ice cream cones cost 20 cents for a single scoop and 35 cent for a double scoop. If a vendor sold \$30 worth of ice cream in a ratio of 2:1 single to double scoops, how many of each kind did he sell?

$$\begin{aligned} 0.20x + 0.35y &= 30 \\ x &= 2y \\ 0.20(2y) + 0.35y &= 30 \\ 0.40y + 0.35y &= 30 \\ 0.75y &= 30 \\ y &= 40 \\ x &= 80 \end{aligned}$$

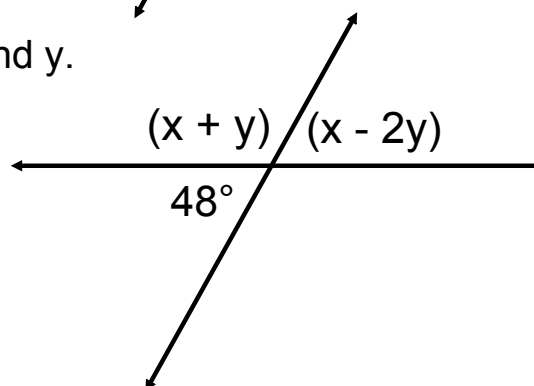
$$\begin{aligned} x + y &= 23 \\ 0.10x + 0.25y &= 2.90 \\ x &= 23 - y \\ 0.10(23 - y) + 0.25y &= 2.90 \\ 2.30 - 0.10y + 0.25y &= 2.90 \\ 0.15y &= 0.60 \\ y &= 4 \\ x &= 19 \end{aligned}$$

$$\begin{aligned} x + y &= 1200 \\ 3x - y &= 800 \\ x + y &= 1200 \\ 4x &= 2000 \\ x &= 500 \\ y &= 700 \end{aligned}$$

- 7) Determine the value of x and y .



- 8) Determine the value of x and y .



Also p. 40 #17* and p. 55 #9

Review for Test: p. 62 #5a, 6, 7bc, 9, 12acd, 13, 14, 16, 17, 18